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INTRODUCTION

The California Environmental Technology Certification Program (CalCert) is the umbrella program for all technology certifications within the California Environmental Protection Agency (Cal/EPA). The operational functions and technical resources are established within the Cal/EPA boards, departments, and offices, including the Air Resources Board, the Department of Toxic Substances Control, the State Water Resources Control Board, the Department of Pesticide Regulation, and the Integrated Waste Management Board.

BACKGROUND

Californians have supported innovative public and private initiatives for a healthier environment for several decades. As environmental awareness and programs evolved, the state's laws and standards became models around the world; they also fostered a vital environmental technology industry. California's high standards and early leadership spawned more environmental technology companies than any other state in the nation. Today, more than 200,000 Californians are employed by companies annually producing over $24 billion worth of pollution control, waste minimization, pollution prevention, and related environmental equipment and services.

In 1993, Cal/EPA and the Trade and Commerce Agency created the California Environmental Technology Partnership (CETP), a public-private partnership comprising of representatives from the financial and legal communities, public interest groups, the technology industry, laboratories, academia, and others. Among several strategies to strengthen California's environmental technology industry, CETP recommended Cal/EPA institute a voluntary statewide certification program for environmental technologies.

THE CAL/EPA CERTIFICATION PROGRAM

Following enactment of Assembly Bill 2060 (Chapter 429, Statutes of 1993) and Assembly Bill 3215 (Chapter 412, Statutes of 1994), Cal/EPA quickly implemented two voluntary pilot certification projects: one for hazardous waste-related technologies at the Department of Toxic Substances Control and the other for air pollution control equipment at the Air Resources Board.

After two successful pilots, and enactment of Assembly Bill 1943 (Chapter 367, Statutes of 1996), **CalCert** expanded to address a broad array of technologies that prevent, treat, or cleanup pollution in air, water, and soil. The program seeks to maintain and advance our high environmental standards by assuring that the best possible environmental technology is available to meet those high standards.

WHAT IS CERTIFICATION?

Certification is an independent, recognized scientific and engineering evaluation of environmental performance. Technology developers and manufacturers define their performance claims and provide supporting documentation; Cal/EPA reviews that information and, where necessary, requires additional testing to verify the claims. Participation in the program generally involves four stages:

- Eligibility request
- Application and data review
- Evaluation of test data
- The evaluation report, certification decision or statement, and certificate issuance

The technologies, equipment, and products that are proven to work as claimed receive state certification. **CalCert** is voluntary and self-supporting. Companies participating in the program pay the costs of evaluating and certifying their technologies.

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BENEFITS OF CERTIFICATION

For a technology developer, manufacturer, or vendor, California certification offers:

- An unbiased, reputable evaluation of the product or equipment's performance
- A means of proving performance claims and gaining credibility for their products or technologies
- An opportunity to demonstrate and test a product on a statewide or even inter-state basis instead of numerous different regulatory jurisdictions
- A potential market advantage that customers and users may consider in their technology investment decisions

For California's citizens and our environment, state certification improves environmental performance by providing safer, better, and less costly solutions. For regulatory officials, **CalCert** offers consistent and recognized evaluation standards, technical information, and opportunities to streamline the permitting process without sacrificing high environmental standards.

PROGRAM RESULTS

To date, Cal/EPA has certified more than 100 environmental technologies. Companies with certified technologies range from domestic manufacturers to multinational corporations. A complete list of certified technologies is available by contacting Cal/EPA.

California's Environmental Technology Certification Program has been honored by the Ford Foundation and Harvard University as an *Innovation in American Government* and by Vice President Al Gore's *Hammer Award* for embodying the National Performance Review principles. **CalCert** has generated national and international interest and replication. California has also developed partnerships with other states and nations to promote the acceptance of certified technologies. Together we nurture the use of innovative technologies for a cleaner environment – in California, throughout the nation, and around the world.

ADDITIONAL INFORMATION

For additional information, please contact:

California Environmental Protection Agency
CalCert
PO Box 2815
Sacramento, California 95812-2815
(916) 327-5789
CalCert@calepa.ca.gov
calepa.ca.gov/CalCert

Is Certification for Me?

This quick guide was developed to help potential candidates determine if CalCert is applicable to the company's technology. Based on our past experience, the most successful candidates for the program have met the following criteria:

- The technology is an air, water, wastewater, solid waste, or hazardous waste-related technology that provides a net environmental benefit.
- The technology is commercially ready with available quality testing data to support performance claims. (If quality data is not available, testing will be needed.)
- The applicant holds manufacturing rights to the technology.
- The technology is applicable to a variety of site conditions.
- The technology is based on sound scientific and engineering principles.
- For hazardous waste related claims, the technology is not an incineration technology, which is precluded by state law from the program.
- For air related claims, the technology must use a fuel with consistent specifications, such as natural gas.
- Technical expertise to evaluate the technology is available within Cal/EPA or one of our evaluation partners (universities and national laboratories).
- The applicant recognizes that certification under this program does not exempt the technology from other regulatory requirements.
- The applicant recognizes that this is a fee for service program, with estimates provided to the applicant and agreed upon before the certification process begins.

Step 1 Contact the California Environmental Protection Agency

You can contact Cal/EPA staff to discuss your technology by phone at (916) 327-5789 or by e-mail at CalCert@calepa.ca.gov. We'll conduct a preliminary discussion regarding the fit between your technology and the certification program parameters. See *Is the Certification Program for Me?* for eligibility information.

Step 2 Request for Eligibility Determination

After the initial contact, Cal/EPA staff may ask for additional information about your technology by mailing you an Eligibility Request. The Eligibility Request gathers general information about the technology, the performance claim you want certified, and the documentation that supports your performance claim.

Cal/EPA staff will review the completed request to determine your eligibility, the projected cost and time for completing the evaluation, and the composition of your evaluation team. The selection of the evaluation team is based on the nature of the technology being evaluated and is comprised of Cal/EPA staff with diverse expertise.

Step 3 The Scoping Meeting

After CalCert has received your Eligibility Request and determined that your technology is eligible for California certification, you will be provided with an *Application for Certification* and invited to meet with the Cal/EPA evaluation team in a scoping meeting.

The evaluation team will meet with you to discuss the scope, duration, and cost of the evaluation. The cost of evaluating your technology will vary depending on the scope of effort needed to evaluate it. Other items that may be addressed include additional testing needs, conditions regarding submittal of proprietary information, refinement of claim language, and items you may wish to discuss. Our goal is to have consensus on all aspects of the evaluation before you submit the Application for Certification.

Step 4 Application Submission and Initial Deposit

An initial non-refundable fee is required to be submitted with the Application for Certification. The Application for Certification gathers detailed information about the technology, specific performance claim language, and test data. A completed application allows staff to determine that:

- Each performance claim is verifiable and based on sound scientific and engineering principles.
- There is sufficient existing analytical data provided for each performance claim.
- There is documentation that the technology will not pose a hazard to public health, or to the environment, if the technology is used under specified operating conditions.

Steps to Certification

Step 5 Application Acceptance and Fee Payment

Cal/EPA staff will review the Application for completeness. Once the application is deemed complete, we will meet with you to resolve the cost estimate for the evaluation and finalize the payment method and conditions.

Step 6 Technology Evaluation

Actual technology assessment begins at this step. The evaluation team reviews the data and critiques the methods, protocols, and results used. Cal/EPA staff may conduct a site visit to see the operation of the system being evaluated. We keep you informed of all progress made during the evaluation phase.

Step 7 The Evaluation Report

The report provides a comprehensive picture of the technology's performance. Particular attention is given to the operating parameters under which the performance claims are made. You will be consulted before the report is finalized.

Step 8 Account Reconciliation and Certificate Issuance

Upon completion of the evaluation report, the final cost is determined and the balance is collected from or reimbursed to you. A certificate, signed by California's Secretary for Environmental Protection, is awarded. The issuance of the evaluation report and certificate authorizes the use of the certified technology seal on certified products.

Step 9 Cal/EPA's Marketing Program

Our marketing activities for certified technologies include distribution of evaluation reports through key networks in the environmental community. Additional market exposure is given through trade shows, conferences, the Internet, and publications.

Steps to Certification

Data Quality Requirements

This document addresses the data quality requirements for analytical data and other information that will be provided by the applicant to support technology performance claims. The certification entity will assess whether this information is acceptable in terms of its relevance, independence, credibility, consistency, abundance, etc.

Supporting documentation must be of *a* quality ready for review by technical experts. The certification entity will evaluate whether the analytical data and other information is acceptable in terms of the following peer-review criteria:

1. Independence in data generation
2. Soundness and consistency of the methods used to generate the data
3. Accuracy, as determined by calibration and repeatability
4. Precision, as determined by replication (reproducibility)
5. Statistical confidence, as measured by the number of independent samples or pieces of information

In addition to providing the results of analytical tests, the following should be included:

1. Who performed sampling and analysis? What is their certification/accreditation status; participation in proficiency testing programs; and their relationship to the technology developers
2. Why the samples were collected
3. When, where, and how many samples were collected
4. How the samples were collected
5. How the samples were prepared for analysis
6. How the samples were analyzed
7. What the analysis procedures can and cannot detect (target compounds and level of detection)
8. What were the Quality Assurance Program and Quality Control procedures used
9. What methods were used to statistically analyze the data and to determine its statistical confidence?

Other information may be evaluated, including a review of technical literature and patents, discussions with other experts in applicable areas of science and engineering, discussions with other independent evaluators of the technology, discussions with users of the technology, etc.

We suggest that you consider the following as you design your environmental performance claims for CalCert. This guidance will assist with the drafting of claims which can be independently verified. Clearly stated claim language will reduce review time and certification costs.

Criteria to Include in Environmental Performance Claims

As you craft performance claims for your technology, please consider the following suggestions:

- The environmental benefits of a technology must be clearly stated. If a technology converts a specific quantity (on a mass basis) of a material from a contaminated medium to another medium the conversion process must not yield residuals which may have adverse environmental effects.

- A claim must be specific, unambiguous and must:
  - Clearly specify the minimum performance that is achievable with the technology. An acceptable claim would state "the technology reduces emissions of a contaminant by at least _% or to a level no greater than _ ppm, lbs/MMBtu at a confidence level of _%."
  - Clearly specify the operating conditions under which the claim is applicable.
  - Not be deceptive and must be subject to only one reasonable interpretation.

Caution should be taken when using relative or comparative terms or expressions in a claim. Expressions such as "better than" or "superior to" will not be accepted if they imply a comparison of specific vendors or brands.

A comparative expression such as "improves" is an acceptable term if it is used in quantifying an advancement of the proponent's own technology and if the proponent has suitable data for both the baseline conditions (before the improvement) and the improved version. The claim language should refer to the nature of the improvement (i.e., portable, shorter processing time, reduced energy consumption, less residuals, etc.)

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- A claim must meet national, state and/or local standards and/or guidelines that are applicable to the technology. Cal/EPA will con sider applicable standards when assessing performance claims.

- A claim must be measurable and verifiable using acceptable test procedures, protocols, scientific and engineering methods, sampling and analytical methods.

Information to Include in Performance Claims

Each claim should include specific information about the technology:

- Technology Identity. Identify the model number, rated capacity, container size, etc.

- Pollutant or Environmental Condition. Describe what condition the technology controls, treats, remediates, or measures.

- Media. Identify the media in which the pollutant or environmental condition is controlled, treated, remediated, or measured by the technology. (Is it in air, water, soil, food?)

- Level of Performance. Specify the degree of control, treatment, or remediation of the technology. For measurement technologies, state the precision, accuracy, and limits of detection.

- Operating Parameters. Describe the technical limits or restrictions that must be followed in order for the technology to achieve the stated level of performance. Examples of these include: fuel requirement; dilution ratio; loading rates; minimum/ maximum flow rates; maximum or minimum contaminant concentrations; other contaminant restrictions; pH, temperature, and pressure requirements; sampling rates; and detention times.

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Examples of Environmental Performance Claims

Here are examples of claims used for media four different types of technologies. Examples are given for air, water, hazardous waste, and measurement/monitoring/site characterization claims.

Example of an Air-Related Claim

"The Acme natural gas-fired boiler (model number ABC-050), rated at 50 horsepower, controls air emissions to less than 25 parts per million (ppm) nitrogen oxides (NOx), less than 50 ppm carbon monoxide (CO) (both pollutants corrected to 3 (three) percent O2) and emissions of less than .05 lb/MM BTU NOx (20 ng NOx /J). This equipment shall be operated and maintained, at all times, in accordance with the most current version of the Acme Boiler Operating and Maintenance Instructions (Acme Document ABC-050-OMI)"

This is an effluent/emission control technology. The claim satisfies the requirement to provide complete information by providing the following information:

- Technology Identity: "Acme...boiler (model number ABC-050)", "rated at 50 horsepower"
- Pollutant or Environmental Condition: "nitrogen oxides (NOx)", "carbon monoxide (CO)"
- Media: "air emissions"
- Level of Performance: "25 parts per million", "50 ppm"
- Operating Parameters: "natural gas-fired", "both pollutants corrected to 3 (three) percent O2", "operated and maintained, at all times, in accordance with the most current version of the Acme Boiler Operating and Maintenance Instructions (Acme Document ABC-050-OMI)"

Example of a Hazardous Materials-Related Claim

"The XYZ Company's hazardous waste treatment technology (CRecover®,Model 100) is capable of recovering up to 99.9% of the chromium from aqueous electroplating waste containing 10 to 1,000 ppm chromium at a feed rate of up to 100 gallons per hour, and when the unit is used in accordance with XYZ Company's operating manual (CRecover® Model 100 Operating manual, Revised 12/97). The 99.9% recovery rate can be achieved only if the iron concentration in the feed is less than 50 ppm and no free phase organics are present."

This is an example of a hazardous waste treatment technology claim. It provides several important pieces of information:

- Technology Identify: “The XYZ Company’s hazardous waste treatment technology (CRecover®, Model 100)...”
- Pollutant or Environmental Condition: “...aqueous electroplating wastes containing 10 to 1,000 ppm chromium....”
- Media: “hazardous waste treatment technology”
- Level of Performance: “recovering up to 99.9% of the chromium”
- Operating Parameters: “aqueous electroplating waste containing 10 to 1,000 ppm chromium at a feed rate of up to 100 gallons per hour, and when the unit is used in accordance with XYZ Company’s operating manual (CRecover® Model 100 Operating Manual, Revised 12/97). The 99.9% recovery rate can be achieved only if the iron concentration in the feed is less than 50 ppm and no free phase organics are present.”

Example of a Water-Related Claim

“The ABC-On Site Wastewater System Model X is a subsur face package plant that uses fine bubble diffusers, filtration, and disinfection for treating single-family residential wastewater (450-600 gal/day influent flow rate). The system removes up to 92% BOD5 , 87% TSS, and can achieve a Fecal Coliform Level of 23 MPN.

Technology performance can be achieved when the ABC-On Site Wastewater System is properly installed and maintained in accordance with the manufacturers guidelines and influent parameters described in the “Installation Guide” and “O&M Manual.” The specified performance of the system depends upon use in ambient outside temperature ranges of 10-45 ºC and the following influent parameters: 150-175 mg/l BOD5; 125-165 mg/l TSS; and Fecal Coliform Count of 100,000 MPN”.

This wastewater treatment claim satisfies requirement to provide complete information by providing the following information:

- Technology Identity: "ABC-On Site Wastewater System Model X"
- Pollutant or Environmental Condition: Domestic sewage
- Media: Water
- Level of Performance: The system removes up to 92% BOD5, 87% TSS, and can achieve a Fecal Coliform Level of 23 MPN.
- Operating Parameters: "Technology performance can be achieved when the ABC-On Site Wastewater System is properly installed and maintained in accordance with the manufacturers guidelines and influent parameters described in the "Installation Guide" and "O&M Manual." The specified performance of the system depends upon use in ambient outside temperature ranges of 10-45 ºC and the following influent parameters: 150-175 mg/l BOD5; 125-165 mg/l TSS; and Fecal Coliform Count of 100,000 MPN."

Example of Measurement/Monitoring/Site Characterization Claim

The following exemplifies a performance claim for a chemical assay for field use (a "screening" method). Other formats would apply to continuous monitoring devices or laboratory equipment.

> "ABC Company's XYZ assay measures polychlorinated biphenyls (PCBs) in water and in soil extracts by an enzymatic reaction resulting in color development and readout by a hand-held, battery-operated colorimeter. The assay measures PCBs at concentrations above 10 microgram/liter and 0.1 milligram/kilogram, up to 1 milligram/liter or 100 milligram/kilogram, respectively. The concentration range can be extended upward by diluting the sample or the extract. The response is in terms of the calibrator, Aroclor1248. The response and detection limits for other Aroclors can be found in a Table provided by the manufacturer. Precision of replicate tests of samples taken from well-mixed volumes of water or soil is generally within 25%. At a true Aroclor level of twice the detection limit, the rate of false negatives (probability of non-detection) is less than 5%; at a true level of one-half the detection limit, the false positive rate (probability of false detection) is 15%. No interferences have been found with common pesticides,

pentachlorophenols, chlorinated and nitrobenzenes at levels up to 100 ppm. High humic content of a soil can, however, mask a positive result. At sites that have not been characterized, a positive finding of PCB contamination by the assay requires confirmation by a fully qualitative and quantitative laboratory method. The assay is sold in kit form. The assay requires some manual dexterity and 4 hours of training. Field training is provided by the manufacturer. The assay uses or produces no hazardous wastes except for the sample. One test can be carried out in 40 minutes; 10 samples can be processed in 1 hour. The test can be carried out at ambient temperatures between 10 and 30 degrees C. It uses a biological reagent that is sensitive to elevated temperatures. With proper storage, shelf life of the biological reagent is 6 months. Adherence to manufacturer's instructions is essential for obtaining accurate results."

This is a field "screening" test for a hazardous pollutant. The claim satisfies the requirements by stating:

- Technology Identity: "ABC Company's XYZ Assay"
- Pollutant or Environmental Condition: PCBs as Aroclors, expressed in terms of Aroclor 1248.
- Media: Water or soil.
- Level of Performance: Detection limit, dynamic range, precision, probability of false negative and false positive results at the detection limit, absence of interferences to the extent tested, matrix effect from humic substances.
- Operating Parameters: Temperature range, reagent shelf life, operator training, generation of hazardous waste.